REMARKS

Rejections Under 35 USC §112, Second Paragraph (Paragraphs 1 and 2 of Office Action)

Claims 6, 18 and 20 have been rejected by the Examiner under 35 USC §112, second paragraph, for the reasons set forth in paragraph 2 of the Office Action. This rejection is respectfully traversed. Reconsideration and withdrawal thereof are requested.

The Examiner asserts that claims 6 and 18 are indefinite because the use of 'M^{I}' and 'M^{III}' indicate that they should be compounds, but they are used to describe metals. Applicants respectfully disagree with this rejection. More specifically, 'M^{I}' and 'M^{III}' are part of a larger complex that also includes a barium metal. Therefore, the Examiner's position with respect to claims 6 and 18 is incorrect and should be withdrawn.

The Examiner asserts that claim 20 is indefinite because it does not set out steps to make a radiation image conversion panel. Applicants respectfully disagree.

The present invention as recited in claim 20 relates to a method for preparing a coating material for a radiation image conversion panel, comprising the steps of:

(a) dispersing a calcined product of stimulable phosphor in a dispersion medium, to obtain a slurry;

(b) eliminating grains that are of at least a predetermined size from the slurry, using wet classification; and

(c) adding a binder to the slurry that is substantially soluble therein, to form a coating material.

According, claim 20 clearly recites a method for preparing a coating material. A potential use of the coating material is for a radiation image conversion panel. The method for claiming the specific potential use to which the Examiner is referring is actually recited in claim 1. Contrary to the position taken by the Examiner, claim 20 adequately describes a method for preparing a coating material. Therefore, this rejection should be withdrawn by the Examiner.

Rejections under 35 USC §103 (Paragraphs 3-7 of Office Action)

Claims 1-3, 5-7, 9-10, 12, 14-15, and 17-20 have been rejected by the Examiner under 35 USC §103(a) as being unpatentable over Leblans '578 (US Patent No. 5,360,578) for the reasons set forth in paragraph 4 of the Office Action. Claims 4 and 16 have been rejected by the Examiner under 35 USC §103(a) as being unpatentable over Leblans '578 in view of Jamil '916 (US Patent No. 5,772,916) for the reasons set forth in paragraph 5 of the Office Action. Claims 8 and 13 have been rejected by the Examiner under 35 USC §103(a) as being unpatentable over Leblans '578 in view of Ochiai '971 (US Patent No. 4,501,971)

for the reasons set forth in paragraph 6 of the Office Action. Finally, claim 11 has been rejected by the Examiner under 35 USC §103(a) as being unpatentable over Leblans '578 in view of Hultsch '454 (US Patent No. 4,405,454). These rejections are respectfully traversed. Reconsideration and withdrawal thereof are requested.

Rejections over Leblans '578

The Examiner asserts that Leblans '578 discloses dispersing a calcined (col. 6, line 50-col. 7, line 6) phosphor in a dispersion medium and eliminating grains of a predetermined size by wet classification (e.g., wet sieving) (see the Abstract, and also see col. 4, line 50-col. 5, line 13, Example 1). The phosphor is then dried (col. 5, lines 34-39) and added to a solution of a binder to form a coating slurry that is applied to the substrate (col. 7, lines 44-53) to form an X-ray panel (i.e., a radiation image conversion panel) (col. 1, lines 9-37). The Examiner further asserts that Leblans '578 discloses classifying the particles in a slurry in a first solvent, such as ethanol or methyl ethyl ketone (MEK) (col. 4, lines 13-25, 38-44), wherein the particles are then dried (col. 5, lines 34-39), and then dispersed in a binder solution of a second solvent, such as 2-methoxy-propanol or ethyl acetate (col. 7, lines 44-47) or methyl ethyl ketone (col. 12, lines 48-57). The

Examiner asserts that Leblans '578 does not explicitly teach that the phosphor is dispersed in the solvent, and then the binder is added to the resulting slurry. However, the Examiner asserts that it is *prima facie* obvious to change the order of performing the method steps.

Regarding claim 2, the Examiner asserts that the solvents may be organic (col. 7, lines 44-47, col. 12, lines 48-57).

Regarding claims 3, 12, 15, and 19, the Examiner asserts that the particles may be classified in order to remove both large (greater than 40 microns) and small (smaller than 2 microns) particles for the reasons given at col. 3, lines 31-56. The particles may be wet sieved to remove the large particles (col. 4, line 56-col. 5, line 13). The undesired small particles may be removed "before drying", which appears to refer to the wet classification step, by sedimenting the desired particles gravitationally or centrifugally and removing the liquid (i.e., decanting) containing the fine particles continuously (col. 5, lines 34-43).

Regarding claims 5 and 17, the Examiner asserts that the particles are sieved by passing through meshes (col. 4, line 50-col. 5, line 7). Particles over 40 microns in size are undesired (col. 3, lines 30-42). Therefore, the Examiner asserts it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a maximum final

mesh size of 40 microns, which is less than 50 microns, in order to achieve the desired particle size range.

Regarding claims 6 and 18, the Examiner asserts that the formula for useful phosphors is given at col. 2, lines 6-17. The Examiner asserts that the ranges for the formula in Leblans '578 overlaps with the instant invention's formula.

Regarding claim 7, the Examiner asserts that Leblans `578 teaches a ratio of approximately 20 parts phosphor per 100 parts dispersing medium for sieving (e.g., Example 1, Example 10).

Regarding claim 9, the Examiner asserts that Leblans `578 teaches that sieving may occur by vibrating the meshes (i.e., screens) (col. 4, lines 50-68).

Regarding claim 10, the Examiner asserts that Leblans `578 teaches that the particles may be sieved through a plurality of stages having decreasing mesh size (col. 4, line 56-col. 5, line 13).

Arguments Distinguishing the Invention over Leblans '578

The present invention is readily distinguishable over Leblans for the reasons set forth in the first two full paragraphs on page 4 of the present specification. Moreover, Applicants have demonstrated unexpected results as is shown by the comparison between Example 1 and the comparative Example as set forth in the present specification.

More specifically, relevant prior art is discussed in the second full paragraph on page 4 of the specification as follows:

> In order to remove coarse grains, there is disclosed a method in which an aggregate reduction process is performed by again dispersing a calcined stimulable phosphor in a dispersion medium, resulting in a slurry, which is subjected to wet classification (Japanese Patent Application Laid-Open (JP-A) No. 11-106748). According to this method, coarse grains formed in calcining the stimulable phosphor can be substantially reduced and a radiation image conversion panel having improved graininess can be obtained.

However, the problem with respect to the prior art method and the solution to this problem is discussed in the third full paragraph on page 4 of the present specification as follows:

> However, the slurry, which has been subjected to wet classification, is dried and grains of the stimulable phosphor thereby form again. Thereafter, the stimulable phosphor is used for preparing the phosphor layer coating liquid. In drying the coating liquid, there is the possibility that the grains will again aggregate into coarse grains to at least some degree. (Emphasis added)

Accordingly, the problem in the prior art was that the grains of the stimulable phosphor tend to aggregate. In contrast, it is an object of the present invention to prevent such aggregation of grains and the present invention achieves this object without the drying step of the prior art discussed above. For example, the graininess of comparative Example 1, where drying was conducted after wet classification, was inferior to the graininess of Example 1, where a binder was added to the slurry without drying the slurry after wet

classification. In contrast, the cited Leblans et al. reference includes drying after wet classification, as pointed out by the Examiner. Thus, the discussion on page 4 of the specification is applicable to Leblans et al.

Therefore, the present invention recites a specific step that provides a clear distinction of the present invention from the teachings of the Leblans et al. reference with respect to drying, as discussed above. Moreover, the present invention improves the Leblans et al. reference in a manner never contemplated by Leblans et al. Furthermore, there are no teachings in the Leblans et al. reference motivating one of ordinary skill in the art to change the steps thereof in order to obtain the steps of the present invention. Indeed, such a modification would be a hindsight reconstruction of the prior art in view of Applicant's own disclosure, and would destroy the teachings of the Leblans et al. reference. Thus, the rejection of the claims over the Leblans et al. reference should be withdrawn by the Examiner.

Rejections over Leblans '578 in view of Jamil `916

The Examiner acknowledges that Leblans `578 does not teach the wet classification a plurality of times. However, the Examiner asserts that Leblans `578 does teach a desired size distribution (col. 4, lines 13-25). The Examiner asserts that

Jamil `916 teaches sieving a phosphors a plurality of times in order to classify the phosphors to a desired size (col. 11, lines 47-62). The Examiner asserts that the repeating process aids in the goal of Jamil `916 of achieving a narrow phosphor particle size distribution (col. 6, lines 10-24). Accordingly, the Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have repeated the sieving process of Leblans `578 in order to have achieved better control (i.e., a narrower distribution) of the particle size, as taught by Jamil `916.

Rejections over Leblans '578 in view of Ochiai '971

The Examiner asserts that Leblans `578 discloses that the phosphor is dispersed in the medium by stirring vigorously (i.e., turbulently) (col. 11, lines 59-63). However, the Examiner acknowledges that Leblans `578 is silent as to the stirring mechanism and therefore does not suggest that the stirring occurs with a mixing blade. Ochiai `971 teaches that phosphor dispersions may be thoroughly mixed by using a propeller mixer. Accordingly, the Examiner asserts that it would have been obvious to one of ordinary skill in the art to have used a propeller (i.e., a mixing blade) mixer as the particular mixing mechanism of Leblans `578 with a reasonable expectation of success.

Regarding claim 13, the Examiner asserts that Leblans `578 is silent as to the relative amounts of the binder and phosphor in the coating solution. Thus, the Examiner asserts it would have been obvious to one of ordinary skill in the art at the time the invention was made to have looked to the related art in order to have determined appropriate relative amounts of the components.

The Examiner asserts that Ochiai `971 discloses a ratio of binder to phosphor is a result-effective variable and should be about 1:100 to 1:20 (col. 5, lines 37-43). The Examiner asserts that it would have been obvious to have optimized the ratio of binder to phosphor within the preferred range.

Further Arguments Distinguishing the Invention over Leblans '578 In View of the Secondary References

None of the secondary references correct the deficiencies of the Leblans et al. reference as pointed out above. Indeed, combining the secondary references with the teachings of the Leblans et al. reference could not possibly suggest the present invention since such a combination would destroy the teachings of the Leblans et al. reference. Accordingly, the combination of references could not suggest the present invention.

In summary, the present invention prevents aggregation of grains. The graininess of comparative Example 1, where drying

was conducted after wet classification, was inferior to the graininess of Example 1, where a binder was added to the slurry without drying the slurry after wet classification. Leblans et al. includes drying after wet classification.

Therefore, the present invention provides a clear distinction of the present invention from the Leblans et al. reference with respect to drying. Moreover, the present invention improves the problems with respect to the primary reference in a manner never contemplated by Leblans et al. Furthermore, there is no suggestion in any of the references motivating one of ordinary skill in the art to change the steps of the primary Leblans et al. reference in order to obtain the steps of the present invention. Indeed, such a modification would be a hindsight reconstruction of the prior art in view of Applicant's own disclosure. Thus, the rejection of the claims over the teachings of the Leblans et al. reference in combination with the teachings of the secondary references should be withdrawn by the Examiner.

If the Examiner has any questions concerning this application, the Examiner is requested to contact the undersigned at the telephone below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim 20 has been amended as follows:

20. (Amended) A method for preparing a coating material for [manufacturing] a radiation image conversion panel, comprising the steps of:

(a) dispersing a calcined product of stimulable phosphor in a dispersion medium, to obtain a slurry;

(b) eliminating grains that are of at least a predetermined size from the slurry, using wet classification; and

(c) adding a binder to the slurry that is substantially soluble therein, to form a coating material.